

OPPORTUNITIES FOR STREAM FISHERY CONSERVATION

The following perspectives on problems and opportunities for watershed management will guide MDC management priorities and activities for the foreseeable future. We realize we are only one of many partners whose joint efforts will be needed to protect and restore stream ecosystem integrity in the Wyaconda River watershed.

MANAGING MDC RIPARIAN OWNERSHIPS

Stream Access Acquisition

MDC has purchased small tracts of land along streams in order to provide public access for recreation and to establish an ownership stake that may strengthen our position in resisting system-wide threats to riparian habitat integrity. In the past, statewide planners have assumed that a desirable spacing was approximately ten stream miles between access areas. Experience suggests that it takes much longer to float and/or fish a typical reach of prairie stream than an equivalent length of Ozark stream. Because of slower currents and more frequent channel obstructions in the prairie region, we should seek to shorten the distance between access areas to five to seven miles on floatable, unchannelized prairie streams with high public use potential.

In order to provide a stream access system with optimal one-day trip distances, MDC should acquire at least one additional access site in the Wyaconda River watershed. Optimal location of this access would be near the Lewis-Clark county border, approximately five to seven miles above Wyaconda Crossing Conservation Area. Above this proposed site, the river is heavily channelized, making the recreational opportunities limited.

Stream Access Development

Because of fiscal restraints, planned developments have not been completed on all existing stream access areas in the Northeast Region. Developments must be completed so citizens can experience the quality recreational opportunities that will build their individual commitment to helping preserve and restore streams in this and other watersheds. As a matter of strategic priority, MDC will put a higher priority on completing planned developments on existing areas than acquiring additional areas.

Both Wyaconda Crossing Conservation Area and Sunnyside School Access should have a concrete boat ramp and 5-car parking lot for stream access. These structures would provide increased opportunity for boaters and stream enthusiasts.

Site-Specific Stream Restoration

Although stream ecosystem health is almost entirely dependent upon processes occurring upstream and downstream of any given ownership, Department of Conservation riparian areas should serve as model of good stream stewardship. In the Wyaconda River watershed,

streambank erosion and forested corridor deficiencies are minor at MDC owned access areas. In areas where the forested corridor is too narrow, passive restoration is being used to increase corridor width.

Public Use Information

Public use of Wyaconda River watershed streams is low to moderate, partially because most people may have stereotyped northern Missouri streams as turbid, unattractive ditches that contain primarily non-game fish. While this may be true for some parts of the Wyaconda River, lower sections contain unique habitats and pleasing scenery.

MDC could increase public use and appreciation of the Wyaconda River watershed streams by developing a brochure describing stream recreational opportunities. Such a brochure would include colored pictures, simple stream maps with mileages, access sites and camping areas clearly marked, descriptions of other local attractions, and fishing opportunities/regulations. Statewide news releases and an article in the *Conservationist* magazine might also help to inform potential users of the opportunities awaiting them in the Wyaconda River watershed.

CONSERVATION OF AQUATIC COMMUNITIES

Statewide, the Department of Conservation has developed a long-term Resource Assessment and Monitoring program (RAM). The objective is to establish standardized sampling methods for several stream ecosystem attributes, especially biotic communities that will allow scientists to provide an accurate, legally defensible portrayal of conditions and trends. Sampling is occurring at random and fixed sites to allow statewide or individual watershed assessments. Information gathered from this effort may be used to prioritize watersheds for conservation.

Long-Term Fish Community Monitoring

Long-term monitoring to assess stream fish community trends has not been conducted in the Wyaconda River watershed. Although some sites within the basin may be included in the statewide RAM program, extensive sampling within that framework is not likely to occur for several years. In the meantime, in order to monitor trends in fish community composition and population levels, the Department of Conservation should conduct fish community surveys at sites randomly selected from among those surveyed during 1988 at least every ten years.

Fishery Management and Research Needs

As in most northeastern Missouri streams, fish communities in the Wyaconda River watershed seem to be imbalanced. Recognizing that our sampling methods may under represent large fishes, surveys in some basin streams still suggests the existence of relatively few fish-eating predators (flathead catfish, black bass or walleye), but large numbers of invertebrate-eating bottom feeders (channel catfish, river carpsuckers, freshwater drum, common carp, and a variety of minnow species). Non-game fishes are represented mostly by species tolerant of the shallow depths and shifting substrates caused by excessive watershed erosion and subsequent stream channel sedimentation. Shifting substrates dramatically reduce biological productivity, so in

channelized streams the large populations of invertebrate-eating fish are almost entirely dependent upon terrestrial inputs or whatever invertebrate production occurs on in-channel woody debris. There are not enough predatory fish to manage the abundant insect-eating fish. Degraded habitat may be the main factor limiting fish-eating predator abundance and thereby preventing ecosystem balance.

Monitoring Contaminants in Fish

The entire basin has been included in a limited consumption advisory issued by the Missouri Department of Health for fish species with a high proportion of fat in their edible tissues (catfish, carp, buffalo, drum, suckers). Levels of concern for chlordane were reported in the early 1990s for catfish in this and neighboring watersheds and the Mississippi River. This advisory was lifted in 2001 due to declining chlordane levels. However, another consumption advisory was issued in 2001 due to mercury contamination. The advisory recommends that pregnant or nursing women, women of childbearing age, and children 12 years of age or younger not eat largemouth bass 12 inches long or longer from anywhere in Missouri.

Long-Term Mussel Community Monitoring

Mussels are found in low densities in most reaches of basin streams. Extensive, basin-wide surveys have not been conducted. The Department of Conservation needs to assess species diversity and abundance by conducting a carefully designed, system-wide survey. Survey sites and sampling periodicities should be consistent with RAM and other fish survey protocols.

SUPPORTING OTHER AGENCIES AND ORGANIZATIONS

The Missouri Department of Conservation works with many other governmental agencies and private conservation organizations in the process of managing stream resources. The following formal or traditional interactions are among the most significant in frequency and scope, and they should be continued.

Missouri Department of Natural Resources (DNR)

MDC assists DNR by periodically recommending water quality standard classifications for stream reaches of special concern and assisting in water pollution investigations whenever an event results in the loss of aquatic life. In such cases, MDC's role is to document the number of dead fish and other aquatic organisms and report to DNR the estimated value of animals lost according to formulas established by the American Fisheries Society. MDC should continue its coordination efforts with DNR to ensure efficient use of state government resources in the conservation of streams in the Wyaconda River watershed.

Missouri Department of Health (DOH)

MDC assists DOH by periodically collecting fish from select streams and preparing tissue samples for analysis of pesticide and heavy metal contaminants. We also cooperate with DOH in advising anglers about precautions to take in the consumption of fish.

U.S. Army Corps of Engineers (COE)

MDC joins several other agencies in commenting to COE and DNR about activities in streams that require permit and certification under Sections 404 and 401, respectively, of the Federal Clean Water Act. COE requires a Section 404 permit for operators who propose to deposit or stockpile material in stream channels; and DNR requires a Section 401 certification for any activity that could significantly degrade water quality. MDC biologists also help to disseminate information about streambed and bank stabilization and stream-friendly sand and gravel removal practices to county commissions, contractors, and landowners.

MDC personnel are often the first agency representatives contacted by neighbors when individuals or public entities engage in what appears to be unpermitted and destructive practices in and along streams. MDC biologists should remain vigilant advocates for the interests on all riparian residents, upstream and downstream, who may be adversely affected by the activities of those few who knowingly violate Sections 404 or 401 of the Clean Water Act.

MDC recognizes that regulations are necessary to protect streams and their watersheds. Watershed management must be approached in a balanced, market-based manner that falls somewhere in the continuum between regulatory protection and voluntary conservation efforts.

Conservation Federation of Missouri (CFM)

MDC facilitates and promotes Stream Team, a program initiated by CFM that seeks to enlist volunteers in the stream conservation effort. One Team has adopted a segment of stream in the Wyaconda River watershed; however, they report little to no activity. Far more citizen activity will be needed for any significant stream improvements to occur within the watershed.

ASSISTING CITIZEN-LED WATERSHED CONSERVATION EFFORTS

We are convinced that the watershed conservation approach will work only if there is widespread recognition that social, economic, and environmental values associated with streams are compatible. If that can be achieved, success will depend upon local initiatives to form diverse partnerships of committed groups and individuals under the leadership of landowners and other local interests.

Watershed restoration is essential to restoring the primary processes that create and maintain fish habitat in healthy stream ecosystems. The most critical and affordable first step in watershed restoration is *passive* restoration—the cessation of human activities that are causing degradation or preventing recovery (e.g., channelization, riparian corridor clearing, indiscriminate gravel dredging, and streamside livestock grazing). Active restoration (e.g., tree revetments and riparian corridor plantings) should be considered only if recovery fails to occur over a reasonable period of time while using *passive* techniques (e.g., livestock exclusion and natural regeneration of woody plants). Because restoring degraded stream ecosystems is more costly and risky than simply protecting fully functional sites, we suggest that protecting and preserving intact riparian ecosystems be the highest priority of watershed-scale restoration efforts.

Protecting Healthy Riparian Corridors–Stream Stewardship

A program aimed at conserving healthy forested stream corridors by placing them into permanent easements using Stream Stewardship Agreements (SSA) was piloted in Marion County between 1992 and 1995. That effort resulted in the permanent conservation of 88 acres of 100- to 200-foot-wide forested corridor on four ownerships along 2.4 miles of the South Fabius River. Although there are no SSA in the Wyaconda River watershed, the infrastructure now exists for MDC to facilitate the permanent conservation of healthy stream corridors, but measurable impact will require funding from a variety of sources. Enrollment of streamside lands in continuous CRP (Conservation Reserve Program) will not substitute for enrollment in SSA or other permanent easement programs because healthy forested corridors cannot be enrolled in CRP, and land enrolled in CRP buffers may be converted back to crop production at the end of the short-term contract periods (10 to 15 years). However, CRP may provide viable first step for landowners on the long path toward converting eroding floodplain crop fields or pastures into functional riparian corridors.

Passively Restoring Mildly Degraded Riparian Corridors–Livestock Exclusion

The activity of livestock can degrade physical aspects of water quality and habitat by causing streambank erosion, resulting in turbidity and stream channel sedimentation. Chemical aspects of water quality can be degraded by livestock waste. In some situations, streambank stabilization, corridor reforestation, and improved water quality can be achieved simply by excluding livestock from stream corridors. For fencing to be attractive to landowners, an alternative source of livestock water must be available (e.g., upland ponds, or shallow floodplain wells tapped by nose pumps or solar-powered pumps). Some landowners may have potential alternative water sources on their property, but may not have the money or the technical support to adopt new technology. Cost-share money for fencing and alternative watering may be available through a variety of federal and state programs. Department of Conservation biologists are available to assist landowners in selecting a practical alternative to instream watering of livestock.

Educating Future Watershed Stewards

Educating our youth about the complexities of watershed processes and problems will be critically important in advancing the science and art of watershed conservation. Today's youth are more technologically oriented and therefore likely to embrace complex information systems. And because of changes in classroom teaching strategy, they are likely to work effectively in problem-solving teams once they become adults.

MDC has found that students in and around the 6th grade are particularly receptive to messages about stream conservation because they can understand most concepts and evaluate new ideas with relatively little social or cultural bias. Classroom teachers may find helpful lesson-planning materials in Missouri's *Stream Team Curriculum*, a watershed-based curriculum developed by teachers, for teachers, that will help students to meet environmental education goals in the Missouri Performance Standards.

Junior high and high school students in vocational agricultural programs may also be prime candidates for watershed conservation education because they are more likely than others to become landowners and other important members of rural communities. Involving these students in hands-on stream conservation activities may contribute to the creation of a new generation of landowners committed to stream ecosystem integrity.

CITIZEN PRIMER TO LEADERSHIP IN WATERSHED CONSERVATION

This section is included as a starting point for citizens who wish to lead or contribute significantly to watershed-based stream conservation efforts. The proliferation of information about watershed planning can be intimidating to individuals or groups who have decided that they have a problem they wish to fix. To facilitate that process, we recommend that potential leaders and contributors to watershed conservation efforts first familiarize themselves with a summary of lessons learned over the past decade about what works and what does not. The list in Table 9 combines the *Top 10 Watershed Lessons Learned* published by the United States Environmental Protection Agency with the ten principles for effectively coordinating watershed-based programs listed by Turner (1997). These documents are highly recommended reading.

Citizens determined to develop and implement watershed conservation plans can also obtain critically important information about organizing and funding such projects by visiting the Internet websites listed in Table 10. These sites contain convenient links to many other sites that, in the aggregate, provide enough information about the watershed conservation process to help any individual or group get started in an informed and effective manner.

Table 9. Ten useful watershed conservation principles.*

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- 1) For watershed conservation approach to work, there must be widespread recognition that social, economic, and environmental values are compatible.
 - 2) Successful watershed conservation requires the formation and support of diverse partnerships under the authority of landowners and other local interest.
 - 3) Leadership is critical in the watershed approach to conservation.
 - 4) A good coordinator is key to successful watershed conservation projects.
 - 5) The best plans have clear visions, goals, and action items.
 - 6) Good tools (planning guides, technical assistance, and funding sources) are available to help watershed groups achieve their goals.
 - 7) It is important to start small and demonstrate success before working on larger scales, celebrating even minor success as it occurs.
 - 8) Plans are most likely to succeed in implemented on a manageable scale.
 - 9) Public awareness, education and involvement are keys to building and maintaining support for watershed conservation efforts.
 - 10) Measuring and communicating progress is essential to the success of watershed conservation efforts.

* For EPA Publication 840-F-97-001, call the National Center for Environmental Publications and Information at 1-800-490-9198.

Table 10. Internet websites containing important information for Missouri watershed planners.

Conservation Technology Information Center

www.ctic.purdue.edu

CTIC is a non-profit, public-private partnership equipping agriculture with realistic, affordable, and integrated solutions to environmental concerns.

EPA Watershed and Wetlands

www.epa.gov/OWOW

This site, created and maintained by the federal Environmental Protection Agency, is a good starting point for information about watersheds and water quality.

Funding Sources for Watershed Conservation

<http://www.epa.gov/owow/funding.html>

This site contains a comprehensive listing of private and public sources of watershed project funding, with links to many individual sites and references to many useful publications.

Know Your Watershed

<http://www.ctic.purdue.edu/KYW/>

This initiative works to encourage the formation of local, voluntary partnerships among all watershed stakeholders for the purpose of developing and implementing watershed plans based upon shared visions of the future.

Missouri Stream Team

<http://www.mostreamteam.org/>

This site provides specific information on activities, programs, and funding sources for volunteers who have adopted Missouri streams or otherwise committed themselves to conserving stream resources in Missouri.

Missouri Watershed Information Network

<http://outreach.missouri.edu/mowin/>

This site serves as a clearinghouse for information about Missouri watersheds.

River Network

<http://www.rivernetwork.org/>

This organization supports development of local watershed partnerships through its Watershed Assistance Grants Program. They seek to fund projects in diverse geographies that have demonstration value on a national scale.